

EXPERT IN INNOVATIVE E-DRIVE SOLUTIONS ACROSS APPLICATIONS

UPTEC INTELLIGENT MANUFACTURING (WUXI) CO., LTD.

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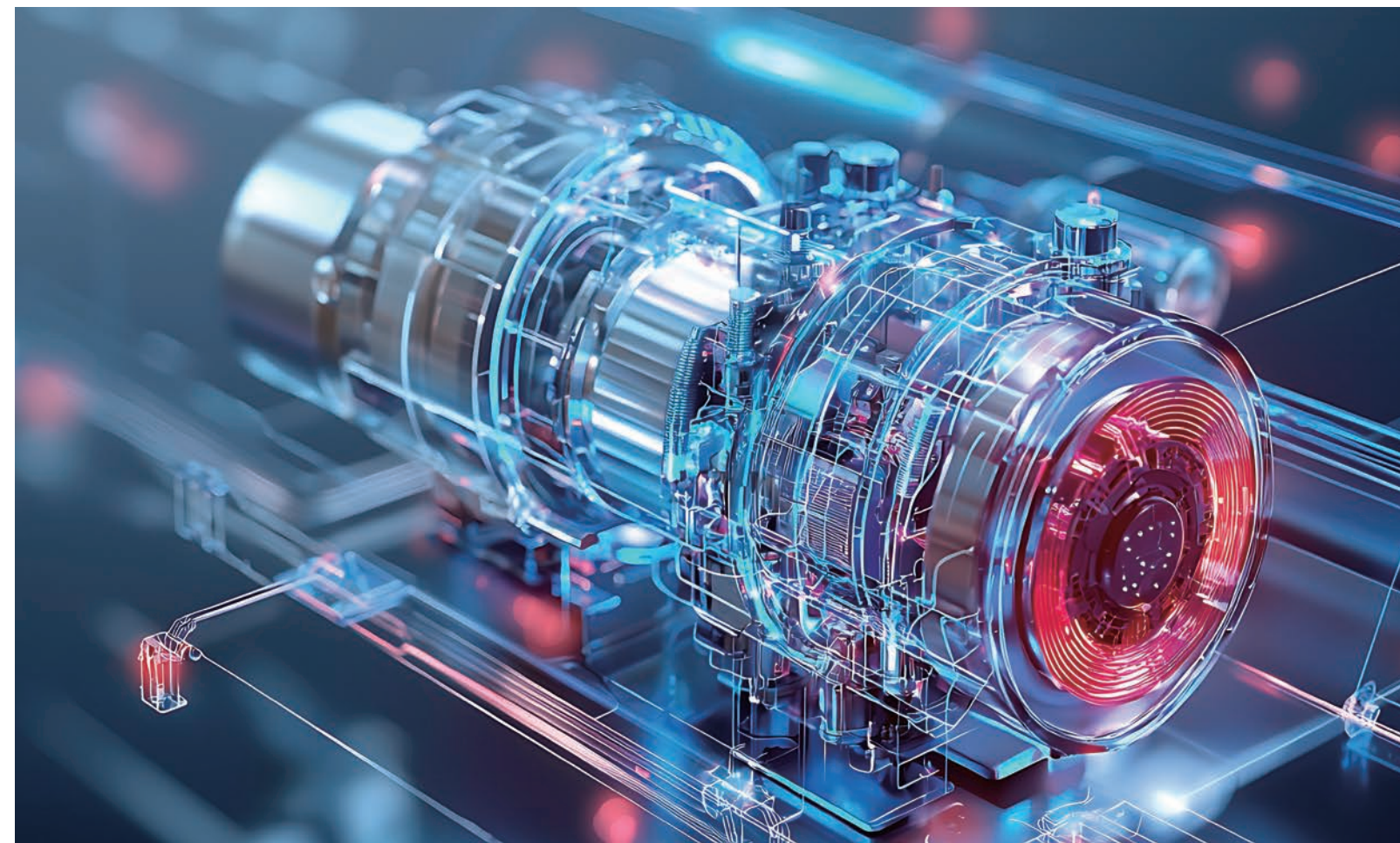
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WE

UNITY AND COOPERATION WALKING HAND IN HAND

ABOUT US

UPTEC Intelligent Manufacturing (Wuxi) Co., Ltd. ("UPTEC") was founded in 2020 by a world-class technical team with over a decade of experience in automotive powertrains, drive-motor development, and intelligent manufacturing equipment. The company has established a 40,000 m² R&D and manufacturing headquarters base, with an R&D team of more than 200 people. UPTEC is a leading provider of innovative E-drive technology solutions for a wide range of applications.

- ① Awarded "China Potential Unicorn Enterprise."
- ② National-level "Specialized, Refined, Distinctive and Innovative Little Giant" enterprise.
- ③ One of China's top three providers of intelligent manufacturing equipment for e-drive technology.

After five years of rapid development, UPTEC has successfully entered the top tier of China's e-drive technology intelligent manufacturing equipment industry and has been recognized as both a national-level Little Giant enterprise and a China Potential Unicorn Enterprise. In the global wave of electrification and intelligent transformation, UPTEC, with innovation as its driving force and practical execution as its foundation, writes a new chapter from "industry pioneer" to "industry leader."

- Global pioneer in platform-based winding and wire-insertion technology.
- Inventor of the integrated widening-and-twisting process and mass-production equipment.
- Delivered China's first wave-pin stator mass-production line.
- Holder of the industry speed record for wire forming, with a cycle time of 0.5 seconds.
- Creator of the industry-standard process route that combines 2D CNC bending and 3D die forming.

2020_{YEAR}

COMPANY ESTABLISHED

40000_{m²}

R&D AND MANUFACTURING HEADQUARTERS BASE

200₊

R&D TEAM SIZE

UPTEC

EXPERT IN INNOVATIVE E-DRIVE SOLUTIONS ACROSS APPLICATIONS



MOTOR PRODUCT
DEVELOPMENT



INTELLIGENT TURNKEY
PRODUCTION-LINE EQUIPMENT



E-DRIVE PRODUCT
MANUFACTURING



SMART FACTORY
SOLUTIONS

BRAND CULTURE



UBIQUITOUS
FULL-APPLICATIONS COVERAGE



UNIQUE
ONE OF A KIND



ULTIMATE
ULTIMATE EFFICIENCY



UNWAVERING
PERSEVERANCE



UNITED
TEAMWORK AND COLLABORATION



UNSTOPPABLE
CONTINUOUS INNOVATION



UNIFIED
FULL-CHAIN SYNERGY



UNIVERSAL
GLOBAL FOOTPRINT



UNFAILING
CONSISTENCY AND RELIABILITY



UNBOUNDED
CROSS-DOMAIN INTEGRATION



VISION



TO BECOME A WORLD-CLASS LEADER IN E-DRIVE TECHNOLOGY AND EQUIPMENT

From being unique in the industry to leading the industry, UPTEC defines new standards for e-drive technology and intelligent manufacturing.

MISSION



DRIVING GLOBAL CHANGE THROUGH INNOVATION

By innovating across applications, products, technologies processes, and equipment, UPTEC helps drive the global shift toward electrification.

VALUE



INNOVATION ACTION AND EXECUTION

With innovation at our core, action as our approach, and execution as our foundation, we bring these three forces together to achieve excellence.

MILESTONES

UPTEC INTELLIGENT MANUFACTURING (WUXI) CO., LTD.

2020
-
2025

- **MAY 2020**
UPTEC Intelligent Manufacturing (Wuxi) Co., Ltd. was established.
- **JULY 2020**
Won an order from a major state-owned enterprise customer for a flat-wire stator production line with annual capacity of 60,000 units.

- **JULY 2021**
Won an order from a leading domestic Tier 1 supplier for a flat-wire stator production line with annual capacity of 120,000 units.

- **APRIL 2022**
Won the equipment order for China's first independently developed wave-winding stator mass-production line.
- **MAY 2022**
Won an order from a Japanese customer for a flat-wire stator production line with annual capacity of 200,000 units.
- **OCTOBER-DECEMBER 2022**
Secured multiple consecutive orders for flat-wire stator production-line equipment from leading domestic and international automotive customers.
- **NOVEMBER 2022**
Recognized as "a Wuxi Engineering Technology Research Center " and awarded "National High-Tech Enterprise status."

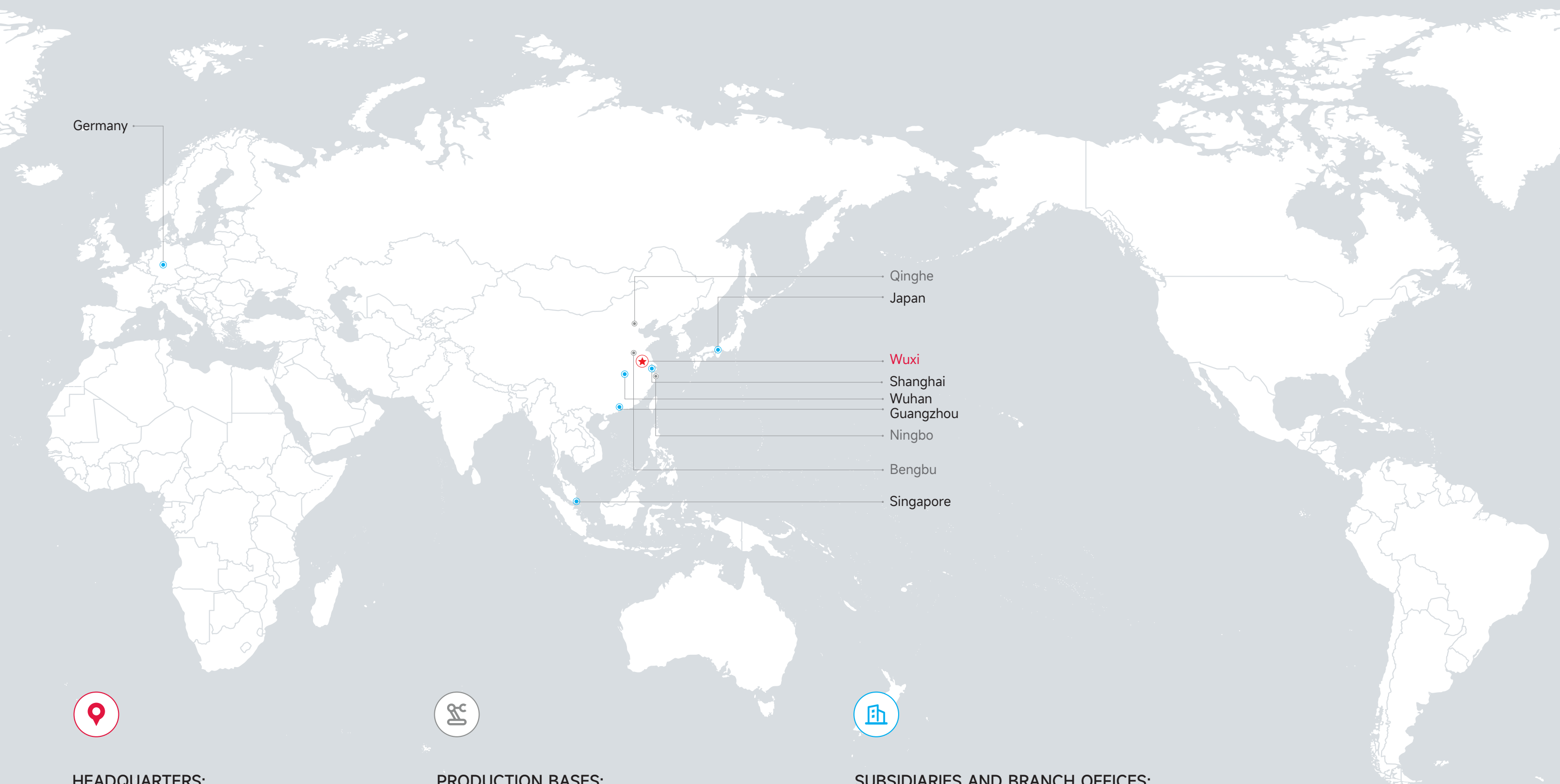
- **JANUARY 2023**
Awarded "Wuxi Specialized and Innovative Small and Medium-Sized Enterprise."
- **APRIL 2023**
Cooperated with a customer in Taiwan to advance a commercial-vehicle flat-wire stator mass-production project; awarded "2023 Jiangsu Potential Unicorn Enterprise."
- **MAY 2023**
The Wanshanhu R&D Center began operations, new-generation flat-wire motor mass-production equipment was released.
- **JULY 2023**
UPTEC established its Japan R&D Center.
- **OCTOBER 2023**
Awarded "Jiangsu Intelligent Manufacturing Leading Service Institution."
- **NOVEMBER 2023**
Won the order for China's first industrial-motor flat-wire stator mass-production line equipment, becoming a pioneer in intelligent manufacturing equipment for this field.
- **DECEMBER 2023**
Awarded "Jiangsu Specialized and Innovative Small and Medium-Sized Enterprise."

- **FEBRUARY 2024**
Won six core equipment orders for 60-second-cycle flat-wire stator production lines; the line-off motor products were used in popular domestic vehicle models.
- **APRIL 2024**
Won an order for a new-generation flat-wire stator mass-production with annual capacity of 250,000 units.
- **JUNE 2024**
Won an overseas customer order for a production-line project with annual capacity of 150,000 units.
- **JULY 2024**
Recognized as "Wuxi Enterprise Technology Center"; Awarded national-level "Specialized, Refined, Distinctive and Innovative Little Giant" enterprise; UPTEC's Bengbu production base in Anhui began operations.
- **SEPTEMBER 2024**
Awarded "2024 Jiangsu Potential Unicorn Enterprise."
- **OCTOBER 2024**
Awarded "2024 China Potential Unicorn Enterprise."

- **JANUARY 2025**
Awarded "Four-Star Cloud Enterprise in Jiangsu" via "AA-Level Informatization-Industrialization Integration Management Assessment."
- **FEBRUARY 2025**
Included in the "Jiangsu Science and Technology Enterprise Listing Cultivation Database."
- **MARCH 2025**
Won an equipment order from a central state-owned enterprise customer for a commercial-vehicle stator and rotor mass-production line.
- **JUNE 2025**
Awarded "Jiangsu Original Influential Innovative Enterprise."
- **JULY 2025**
Awarded "Jiangsu Province First Major Equipment Set " recognition.
- **AUGUST 2025**
UPTEC's Wuxi headquarters on Lianfu Road officially opened.
- **SEPTEMBER 2025**
Passed DCMM Data Management Capability Maturity Level 2 assessment.
- **NOVEMBER 2025**
Awarded "Jiangsu Green Factory."
- **DECEMBER 2025**
Awarded "2025 China Potential Unicorn Enterprise."

202020212022202320242025

GLOBAL FOOTPRINT



HEADQUARTERS:
No. 1288 Lianfu Road, Xishan District, Wuxi.



PRODUCTION BASES:
Ningbo, Qinghe, Bengbu.



SUBSIDIARIES AND BRANCH OFFICES:
Shanghai, Wuhan, Guangzhou, Singapore, Japan and Germany.

HONORS AND AWARDS



AUGUST 2025
2025 E-Drive Technology Innovation Award.



OCTOBER 2025
7th Gasgoo Awards — Best Technology Breakthrough Application Award.



DECEMBER 2025
Selected as one of the Top 20 technological transformation projects in Xishan Economic and Technological Development Zone.



SEPTEMBER 2024
Selected as a Top 100 project in the Jiangsu Small and Medium-Sized Enterprise Innovation and Entrepreneurship Competition.



NOVEMBER 2024
9th Lingxuan Award — Gold Award in Commercial Drive Intelligent Equipment and Processes.



DECEMBER 2024
Xishan Economic and Technological Development Zone Science and Technology Innovation Gold Seed Award.



OCTOBER 2023
China E-Drive Industry Technology Innovation Award.



NOVEMBER 2023
8th Lingxuan Award — Excellence Award in Advanced Equipment Processes and General Category.



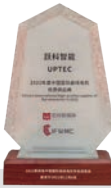
DECEMBER 2023
“Qianlima Award” for Outstanding Production-Line Integrator.



OCTOBER 2022
Top Domestic User-Side Equipment Enterprise.



DECEMBER 2022
7th Lingxuan Award — Mass-Production Powertrain Excellence Award.



DECEMBER 2022
China International Flat-Wire Motor Quality Supplier.



APRIL 2021
2020 Annual Flat-Wire Motor Supplier Contribution Award.



OCTOBER 2021
Jiangsu “Double Innovation Talent” honor.



OCTOBER 2021
Wuxi “Taihu Talent Plan” Entrepreneurship Leading Talent.



NOVEMBER 2021
FWMC Victory Global Award — 2021 Customer-Trusted Flat-Wire Motor Brand.

PATENTS & CERTIFICATIONS





220⁺
GLOBAL PATENTS



30⁺
SOFTWARE COPYRIGHTS



7
SYSTEM CERTIFICATIONS



ISO9001
ISO14001 and ISO45001
system certifications



IATF16949
system certification



Integration of
Informatization and
Industrialization
Management
System Certification



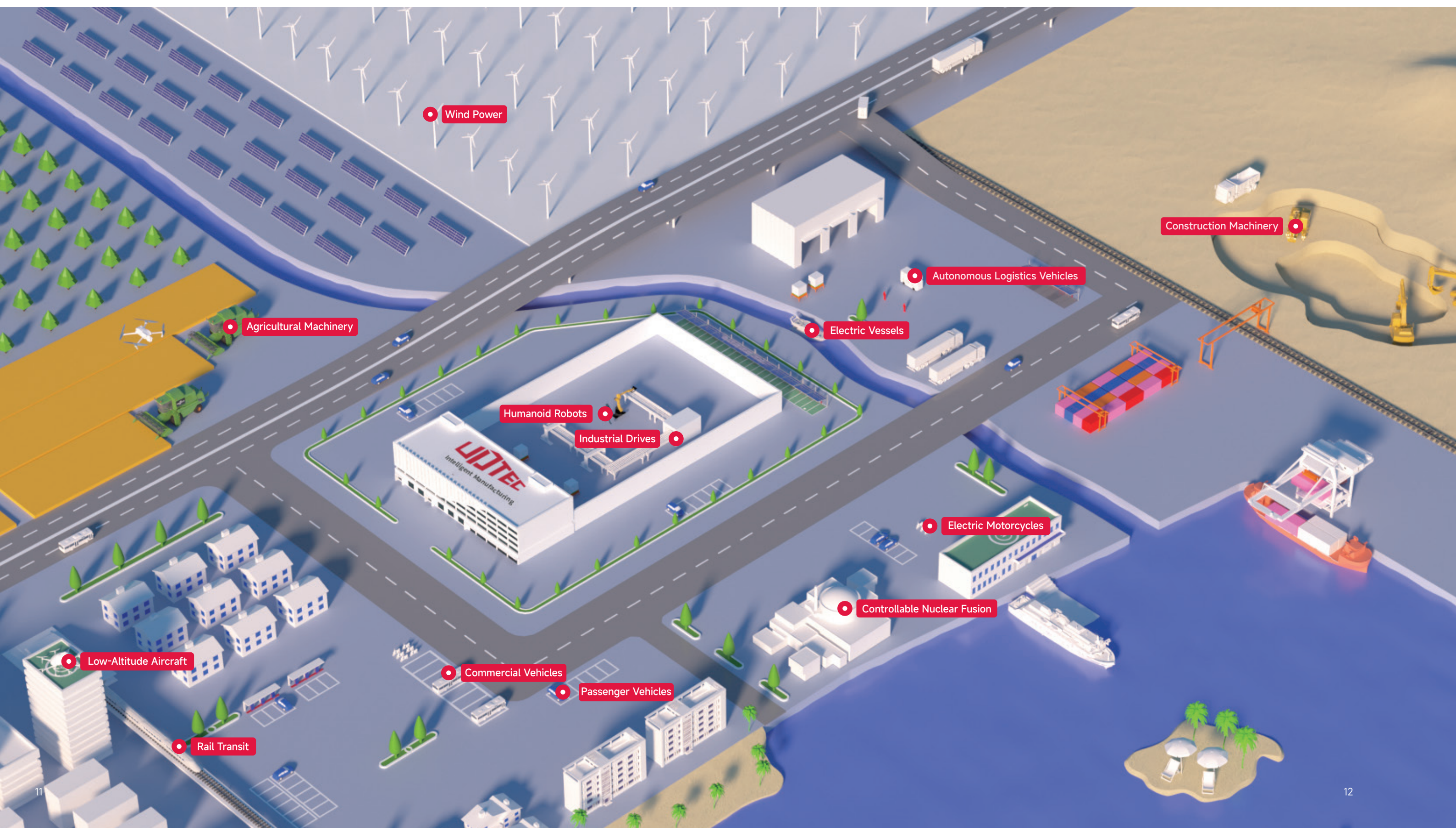
Energy management
system certification



Intellectual property
management
system certification

APPLICATION SCENARIOS

13+ Applications Across 13+ Fields



STRATEGIC PARTNERS

50+

GLOBAL STRATEGIC PARTNERS

“WORKING TOGETHER TO CREATE THE FUTURE”

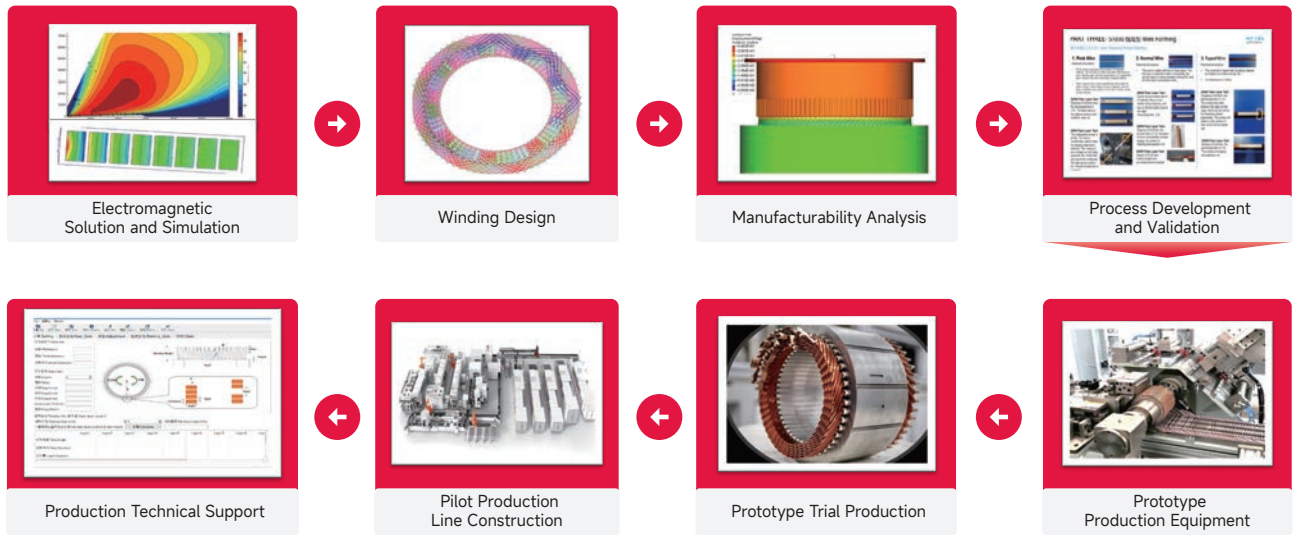
Every UPTEC innovation and every milestone in our growth has been made possible by the support and trust of our partners worldwide. We embrace an open, win-win and value-creation cooperation philosophy, working with outstanding industry partners to collaborate through innovation and create value through real-world practice. Facing the global trend of electrification and intelligent transformation, UPTEC is willing to move forward with partners. Together, we aim to advance the e-drive industry and help shape a greener, smarter, and lower-carbon future.



MOTOR PRODUCT DEVELOPMENT

UPTEC has end-to-end capabilities in flat-wire motor product development. We provide full-lifecycle system solutions covering product development, prototype trial production, testing and validation, small-batch production verification, and large-scale standardized manufacturing.

FULL-PROCESS DEVELOPMENT SERVICES



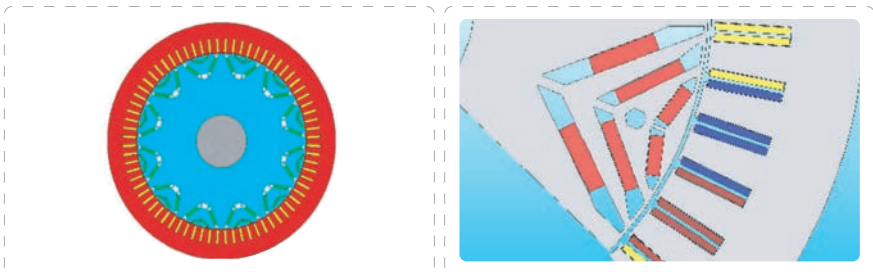
NEW MOTOR DESIGN



PMSM FORWARD DESIGN AND DEVELOPMENT PROCESS

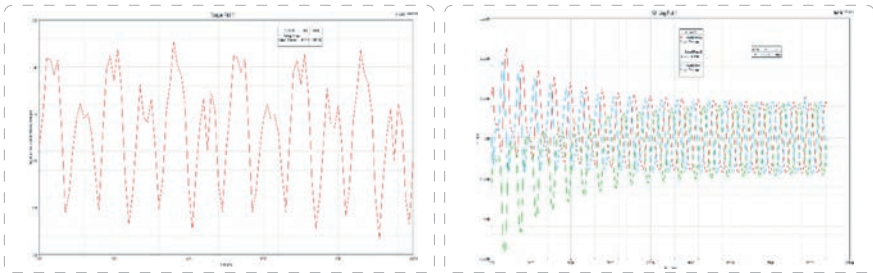
01

Determine the pole-slot combination and rotor topology.



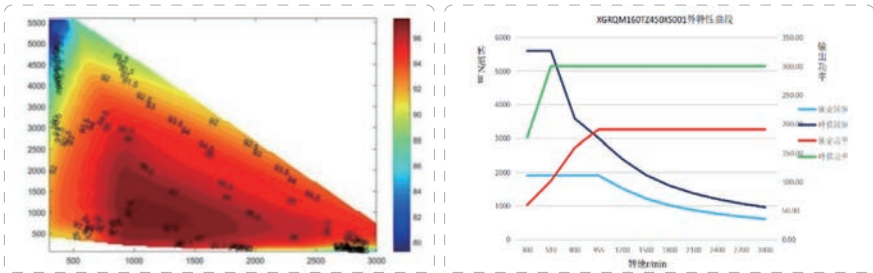
02

Calculate electromagnetic parameters, including torque, current, and back EMF.



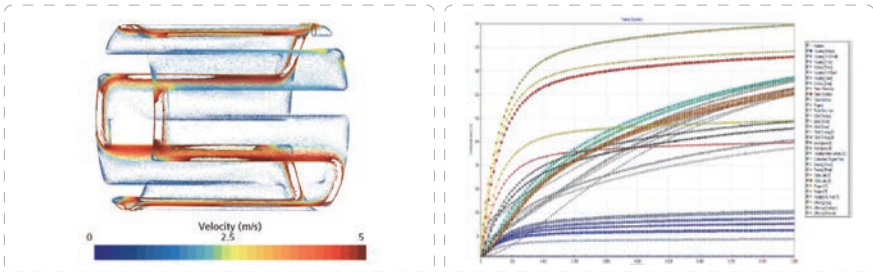
03

Calculate external characteristics and simulate the efficiency map.



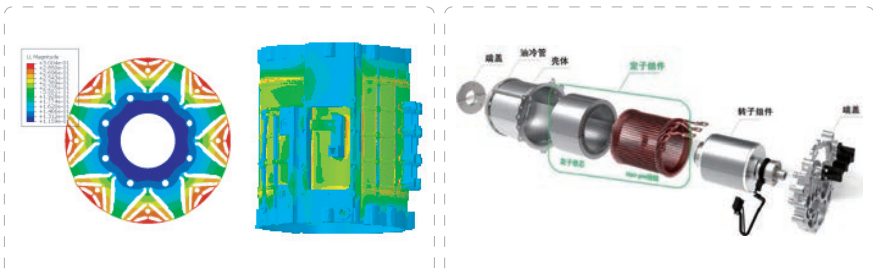
04

Build thermal-fluid models and simulate the temperature field.



05

Perform CAE analysis, winding modeling and structural design.



■ A/B/C PROTOTYPE DEVELOPMENT

Rapid Sample Development

Sample Equipment
and Tooling Development

Manufacturability
Analysis and Validation

Stator/Rotor/Motor
Assembly Development

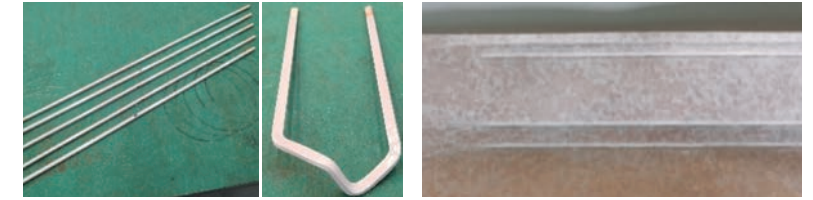
Up to 12 Layers
in The Stator Slot

Stator Diameter
Range 80mm~800mm



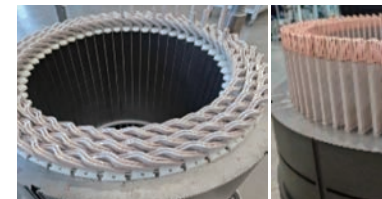
■ PROTOTYPE PRODUCTION

PROCESS FLOW



Hairpin forming

Insulation-paper forming



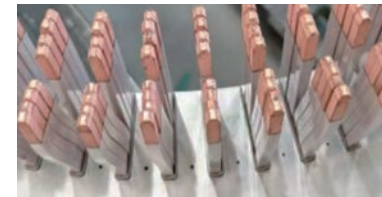
Press-in



Wire insertion



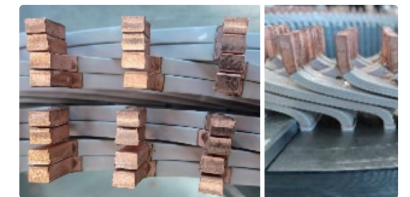
Insulation-paper insertion



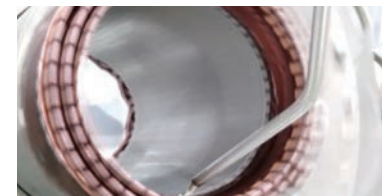
Widening



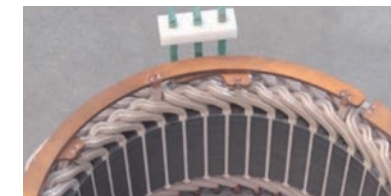
Twisting



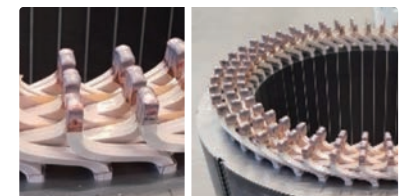
End trimming



Varnish impregnation



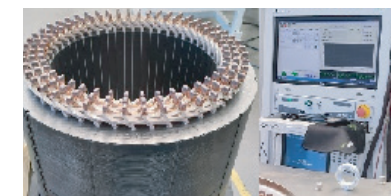
Busbar welding



Welding



Coating



Inspection and electrical testing

PROTOTYPE DELIVERY

INTELLIGENT TURNKEY PRODUCTION-LINE EQUIPMENT

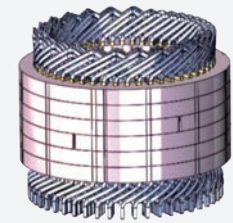


UPTEC has world-leading expertise in the development and manufacturing of automated production-line equipment for flat-wire motors. Leveraging China's manufacturing supply-chain advantages and extensive experience serving diverse customer needs, UPTEC provides customized turnkey production-line solutions for e-drive systems, delivering differentiated value and distinctive competitive advantages to customers.

■ FLAT-WIRE STATOR TECHNOLOGY PORTFOLIO

01

HAIR-PIN STATOR



02

MINI-PIN STATOR



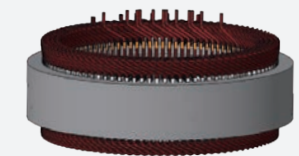
03

X-PIN STATOR



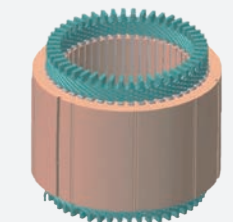
04

WAVE-PIN STATOR



05

I-PIN STATOR



■ HAIR-PIN STATOR AUTOMATED PRODUCTION LINE

HAIR-PIN STATOR
AUTOMATED PRODUCTION LINE

90%

AUTOMATION RATE

≥ 98%

FIRST-TIME PASS RATE

≥ 85%

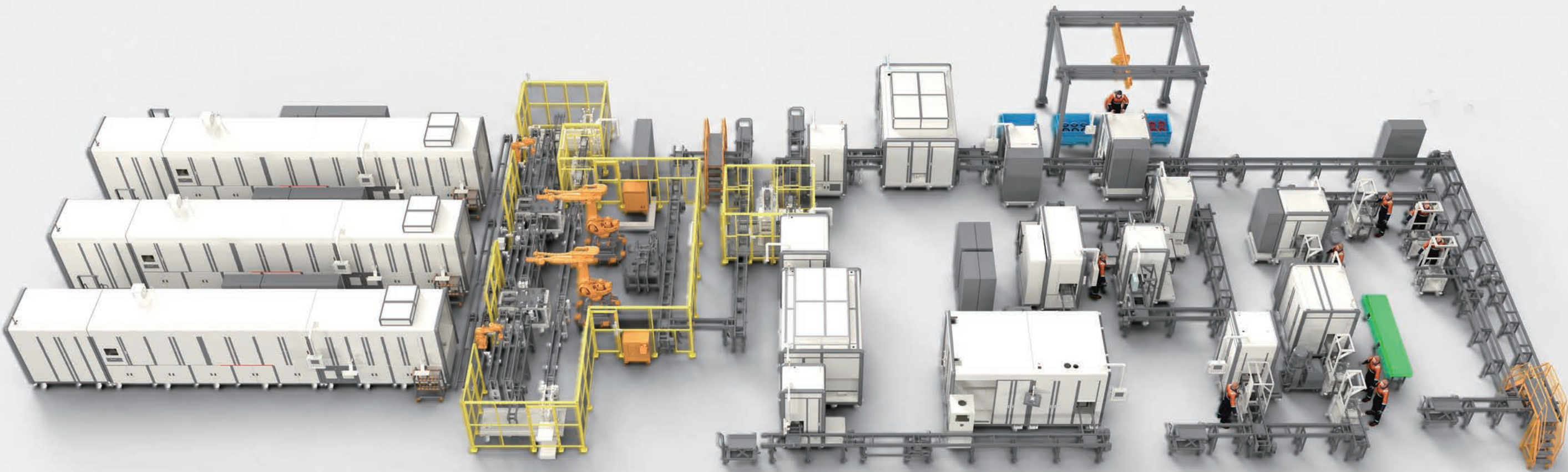
OEE

Compatible with Mini-Pin and X-Pin

Delivery Cycle of 4~6 Months

Flexible Design and Convenient Model Change

Lean Planning with Phased Investment and
Capacity Expansion



■ X-PIN STATOR AUTOMATED PRODUCTION LINE

X-PIN STATOR
AUTOMATED PRODUCTION LINE

90%

AUTOMATION RATE

≥ 98%

FIRST-TIME PASS RATE

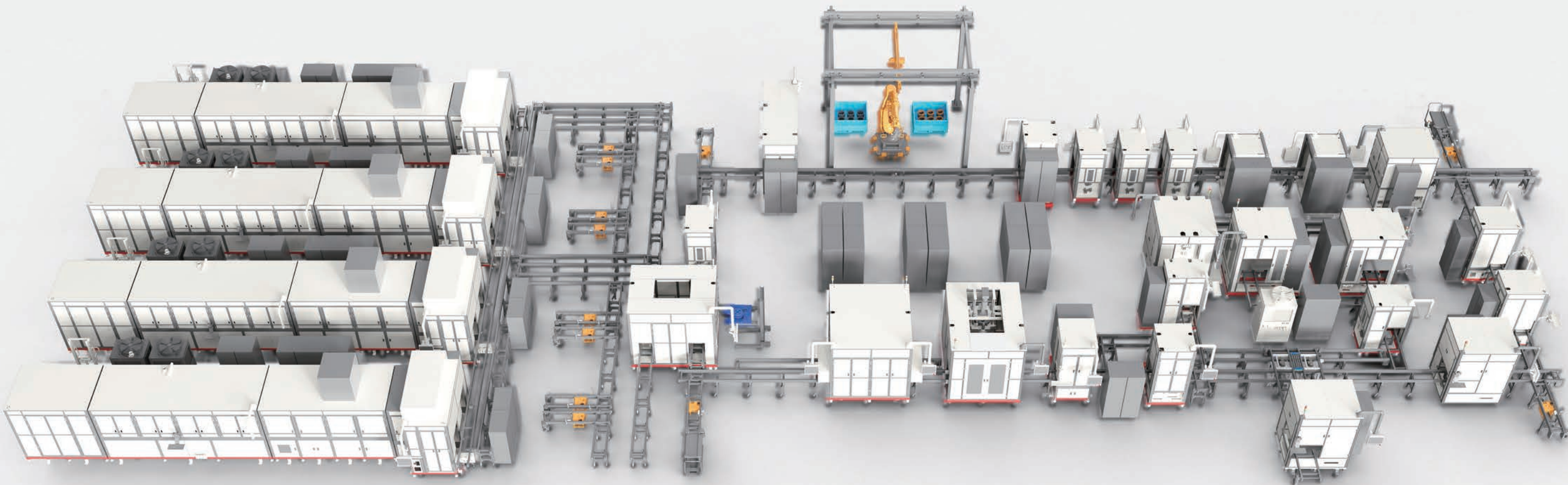
≥ 85%

OEE

Flexible Design and Convenient Model Change

Lean Planning with Phased Investment and
Capacity Expansion

Delivery Cycle of 4~6 Months



■ WAVE-PIN STATOR AUTOMATED PRODUCTION LINE

Guided by electromagnetic principles, this is China's first independently developed wave-winding stator mass-production line.

90%

AUTOMATION RATE

≥ 96%

FIRST-TIME PASS RATE

≥ 85%

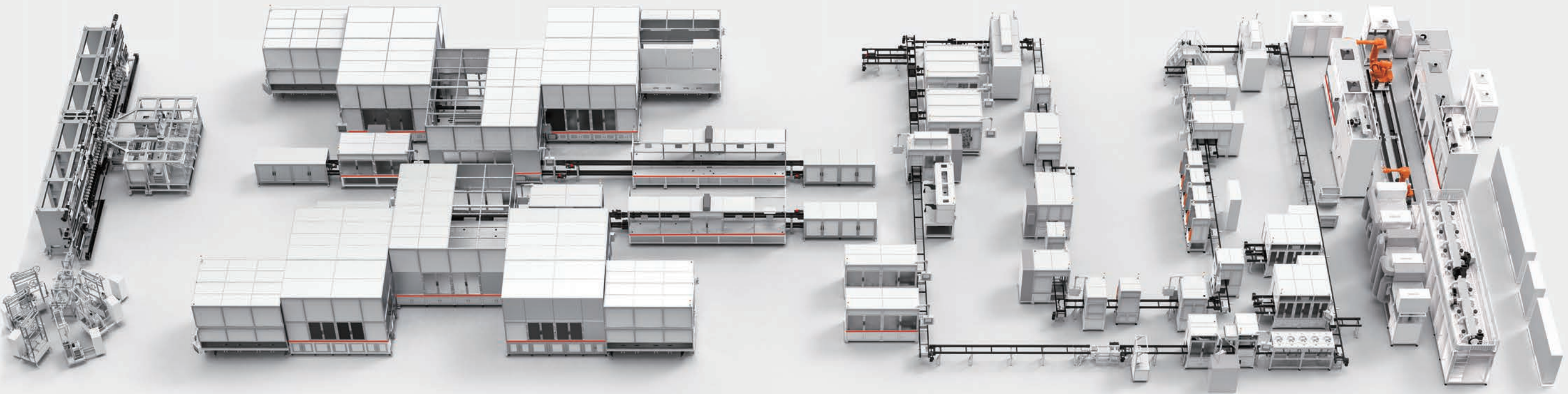
OEE

Modular Design with High Compatibility

Delivery Cycle of 5~7 Months

Compatible with Both Inner and Outer Wire Insertion

Lean Planning with Phased Investment and Capacity Expansion



01 Automated Magnet Insertion

Efficient automated magnet insertion; vision-based error proofing detects missing or incorrectly installed magnets, improves product yield.

02 Thermoset Injection Molding Process

Can be jointly developed with third-party suppliers for thermoset epoxy and thermoplastic PA66 injection-molding equipment, achieving high filling rate, low scrap rate and long mold life.

03 Coordinated Complete-Line Operation

High automation rate, good stability, high production efficiency, strong compatibility and high flexibility.

04 Integrated Dynamic Balancing and Magnetization

Dynamic balancing under thermal conditions and magnet processes, with automated integration of third-party balancing and magnetizing equipment; high first-pass dynamic balancing rate and good magnetization consistency.

HIGH AUTOMATION RATE

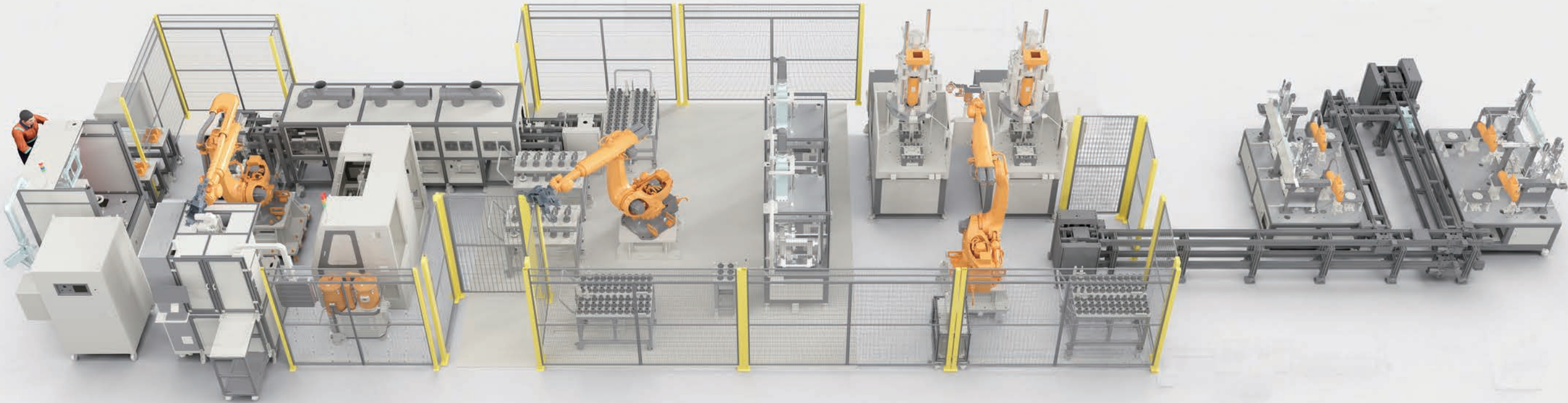
STABLE AND RELIABLE

HIGH YIELD RATE

STRONG COMPATIBILITY

HIGH FLEXIBILITY

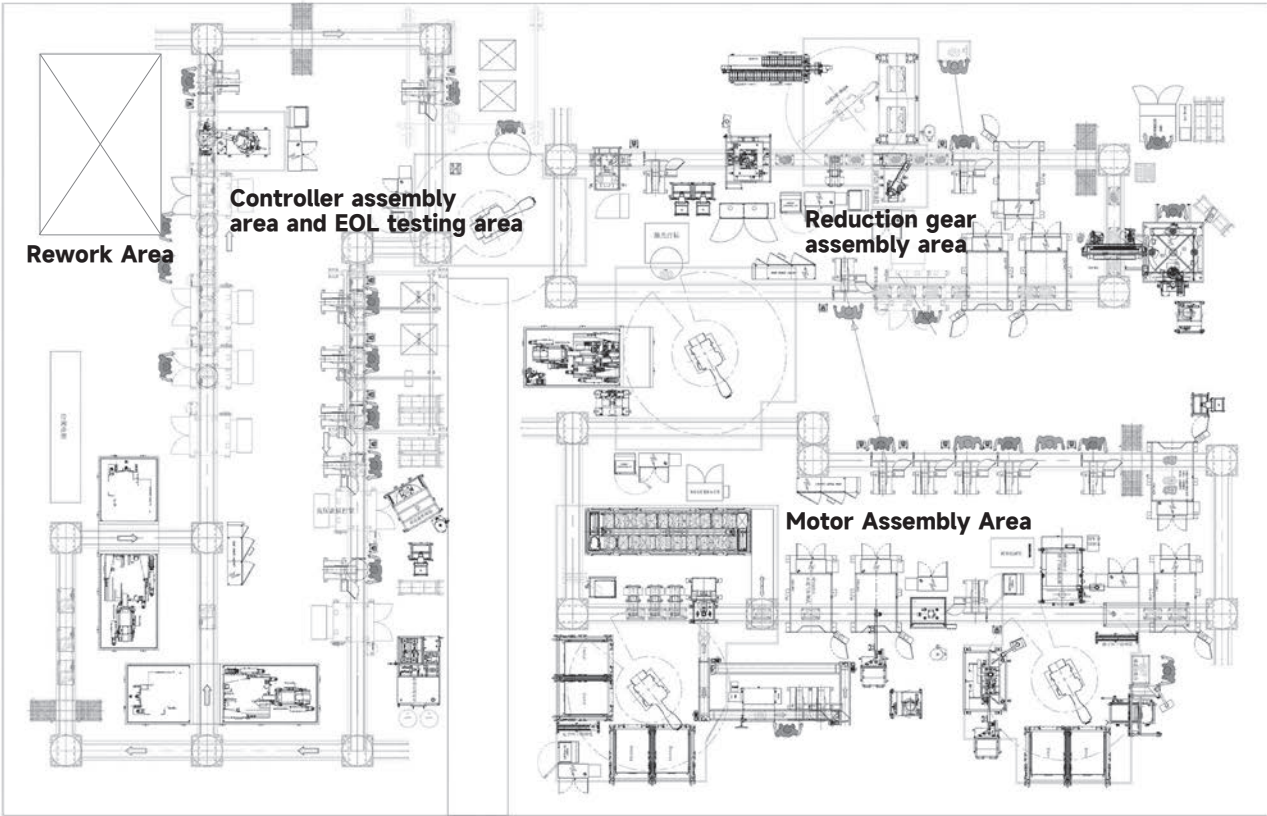
INTELLIGENT MANAGEMENT



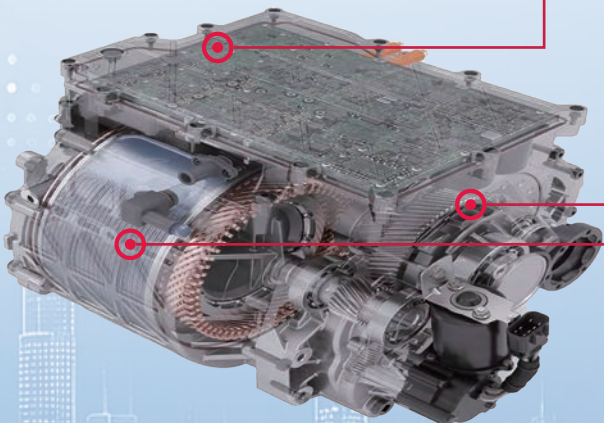
MOTOR / E-DRIVE AUTOMATED ASSEMBLY LINE

ADVANTAGES OF THE E-DRIVE THREE-IN-ONE ASSEMBLY LINE

- 01 Precision stator-rotor alignment and a floating mechanism help prevent abnormal bearing stress during assembly.
- 02 Automatic precision shim selection for reducer bearings, with shim selection accuracy up to 0.01 mm.
- 03 Standardized process applications, including coating, tightening, press-fitting and testing, ensure product consistency.
- 04 Comprehensive error-proofing protection prevents assembly defects such as wrong installation, reverse-direction assembly and missing installation.
- 05 High complete-line automation, good stability, high production efficiency, strong compatibility and high flexibility.



E-DRIVE THREE-IN-ONE ASSEMBLY



CONTROLLER



REDUCER



MOTOR



■ AUTOMATIC CORONA PROTECTION TAPING MACHINE

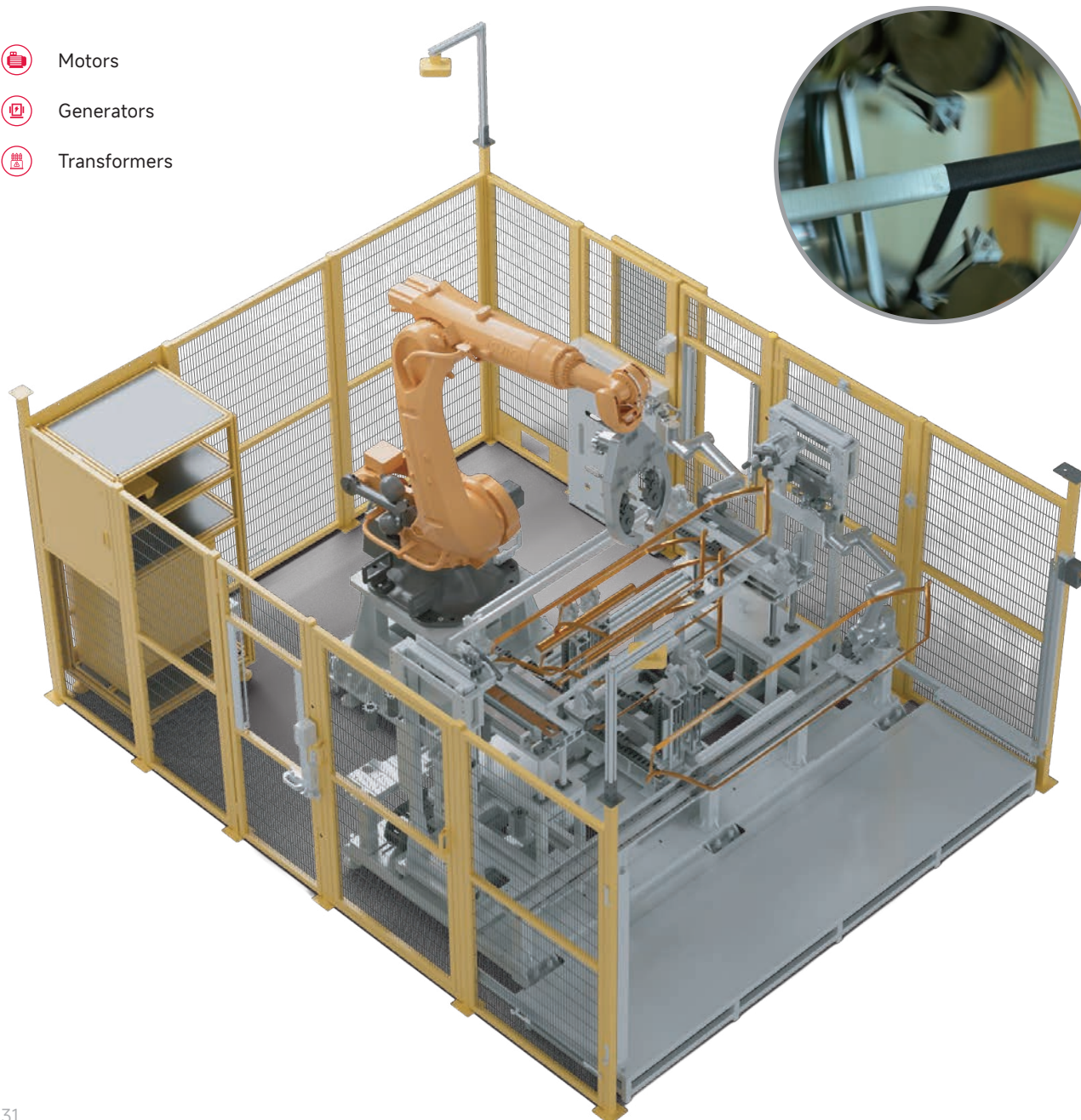
CPT

Engineered for
Electrical-coil insulation wrapping

The Corona Protection Taping machine, or CPT machine, is a dedicated automatic machine for applying corona protection and stress grading tapes to high-voltage coils. It accurately and consistently wraps materials such as conductive tape, stress grading tape, polyester film, polyimide tape, fiberglass tape and other materials onto straight and bent sections of 3D formed coils, helping manufacturers achieve reliable corona protection, stable insulation quality and repeatable production results.

A precision mechanical system and intelligent robot work in coordination to tape straight and bent sections in one continuous operation. By replacing manual taping, the system significantly improves productivity, wrapping consistency and product quality. It is ideal for manufacturing motor, generator and transformer coils.

-  Motors
-  Generators
-  Transformers



APPLICATIONS AND CORE ADVANTAGES



- **APPLICABLE PRODUCTS**
Insulation wrapping for motor windings, generator windings, transformer coils and other electrical coils.
- **COMPATIBLE COIL TYPES**
O-shaped, V-shaped, straight and various special-shaped coils.
- **APPLICATION RANGE**
Customer-oriented semi-automatic and fully automatic modes. Suitable for high-precision wrapping of large motor coils and continuous batch production of small and medium-sized coils.

CORE FUNCTIONS AND ADVANTAGES



FAST CHANGEOVER, FLEXIBLE PRODUCTION

Designed for high-mix, low-volume production, the system enables quick and convenient changeovers and setup. Switching between standard wire configurations takes only 30–60 minutes, accommodating diverse customer production requirements.



AUTOMATIC MATERIAL SWITCHING

Enables synchronized switching between two different materials—carbon tape and semiconductive tape—to improve taping efficiency and shorten taping time.



INTELLIGENT CONTROL, HIGH CONSISTENCY

Parameters are set through the human-machine interface (HMI), while the controller precisely issues commands for consistent robotic execution. This effectively eliminates problems associated with manual taping, such as overlap inconsistency, layer misalignment, and uneven wrapping.



CONSTANT-TENSION CONTROL, STABLE WRAPPING

A customized servo-control system maintains constant tension on the taping material in real time, ensuring tight, smooth, wrinkle-free wrapping without looseness for reliable insulation performance.



REDUCED MATERIAL USE AND LOWER COSTS

Precise automated wrapping minimizes manual rework, waste, and repeated wrapping, effectively reducing insulation material consumption.



STABLE QUALITY CONTROL, HIGHER YIELD

Standardized operations eliminate defects such as over-wrapping, under-wrapping, excessive or insufficient tension, and overlap misalignment, ensuring more consistent and controllable product quality.

E-DRIVE PRODUCT MANUFACTURING

UPTEC has complete closed-loop capabilities covering motor product development, production process R&D, complete-line equipment manufacturing, and mass-production line construction and delivery. It can meet customers' product customization needs at different stages and leverage UPTEC's self-developed intelligent turnkey production-line equipment to rapidly achieve large-scale manufacturing.

BUSINESS SCENARIOS

-  **SCENARIO 1** The customer's new product is still in an early stage and the first batch has not yet met mass-production requirements. Building a complete in-house automated production line would not be cost-effective, making OEM manufacturing a suitable option.
-  **SCENARIO 2** The customer's new product has been validated and needs rapid launch and production capacity ramp-up. To verify whether the design is suitable for large-scale production, OEM manufacturing can be used as an interim solution.
-  **SCENARIO 3** Demand for a mature customer product increases in the short term. To reduce manufacturing cost and mitigate production-line investment risk, OEM manufacturing provides a flexible and cost-effective solution.
-  **SCENARIO 4** The customer is not yet fully familiar with UPTEC's product manufacturing processes or intelligent turnkey production-line equipment. OEM manufacturing can support early-stage validation before the customer proceeds with the purchase of complete-line equipment.

CORE ADVANTAGES



SPEED

Intelligent and flexible production, rapid changeover, and fast capacity ramp-up.



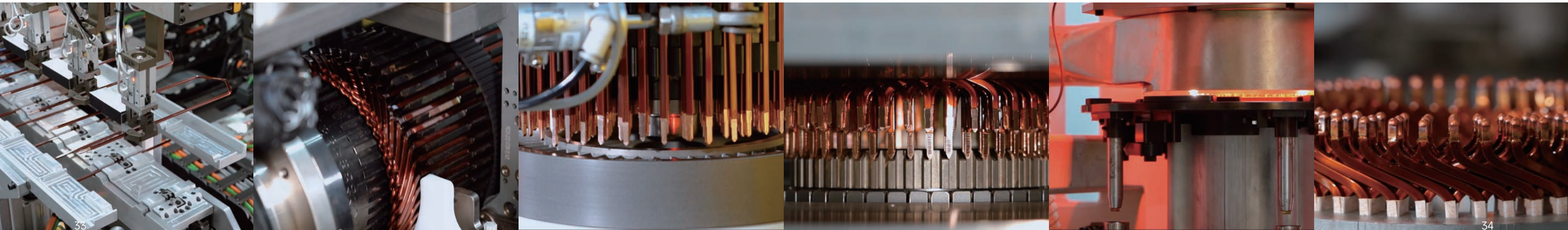
STABLE

Closed-loop capability across product, process and equipment; systematic and highly compatible.



SCALABLE

Highly-automated, standardized, modular, cost-efficient, and high-yield.



■ MASS-PRODUCTION EXPERIENCE ACROSS MULTIPLE SECTORS

Multi-Sector
Requirements Analysis



Product Design
Prototype Testing, and Validation



High-Volume
Production and Delivery



■ PRODUCTION OPERATIONS SYSTEM

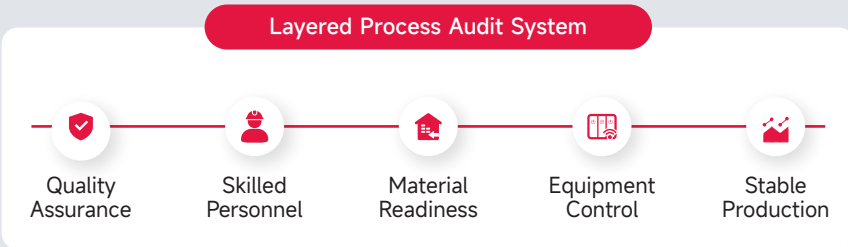
○ PRODUCT DEVELOPMENT

Project Initiation	Electromagnetic Solution	Structural Design	Prototype	Testing	Design Freeze
• Design Inputs • Project Feasibility • Development Plan	• Electromagnetic Design • Electromagnetic Simulation • Fluid Modeling • Thermal Simulation • NVH Simulation	• Stator Structure • Rotor Structure • System Structure • 3D Digital Model • DFMEA	• Design for Manufacturability • Prototype Manufacturing Process • Prototype Tooling • A/B Prototypes	• Performance Testing • Reliability Testing • Durability Testing	• Final Drawings • BOM (Bill of Materials) • SC (Special Characteristics) List

○ INDUSTRIALIZATION PROJECT DEVELOPMENT

Project Initiation	Process Solution	Production Line Planning	Equipment Development	Production Ramp-Up	Mass Production
• Production Capacity and Takt Time • Investment Budget • Floor Space • Automation Rate	• New Process Development • Process Flow • PFMEA • Process Special Characteristics (SC)	• Production Line Specifications • Layout • Line Balancing • Logistics Plan • Error-Proofing Design	• Equipment 3D and 2D Design • Tooling and Molds • PLC Programming • MES	• CMK • PPK • MSA • Issue Resolution • Validation Plan	• Work Instructions (WI) • Total Productive Maintenance (TPM) • Control Plan • Error-Proofing Checklist

○ PRODUCTION OPERATIONS MANAGEMENT SYSTEM



○ SUPPLY CHAIN MANAGEMENT SYSTEM



SMART FACTORY SOLUTIONS



The fourth industrial revolution is accelerating, driven by the integrated application of artificial intelligence, robotics, the Internet of Things, 5G communications, edge computing and big data. As the physical and digital worlds become deeply integrated, the global manufacturing landscape is being reshaped. As a leading enterprise in e-drive technology and equipment, UPTEC is an important practitioner and contributor to this transformation.



MES SYSTEM

The MES smart manufacturing collaboration platform uses digital tools to centralize resource management, improve operational control, and provide manufacturers with a robust, reliable, comprehensive, and practical platform for collaborative production management.



SEVEN FUNCTIONAL MODULES

7



TRACEABILITY MONITORING

- Alarm Management
- Standard Reports
- Electronic Kanban
- Reporting Platform



DATA COLLECTION

- Equipment Parameters
- Work-Hour Management
- Equipment Inspection
- Product Processing Parameters
- Maintenance Management



EQUIPMENT MANAGEMENT

- Fault Alarm
- Spare-Parts Management
- Fault Statistics and Analysis
- Operating-Status Management



PRODUCTION DOCUMENTATION

- Work Instructions
- Equipment Maintenance Manual
- Equipment Operation Manual
- Personnel Information



PLANNING COORDINATION

- Order Coordination
- Work-Order Reporting
- Work-Order Issuance
- Material Transfer



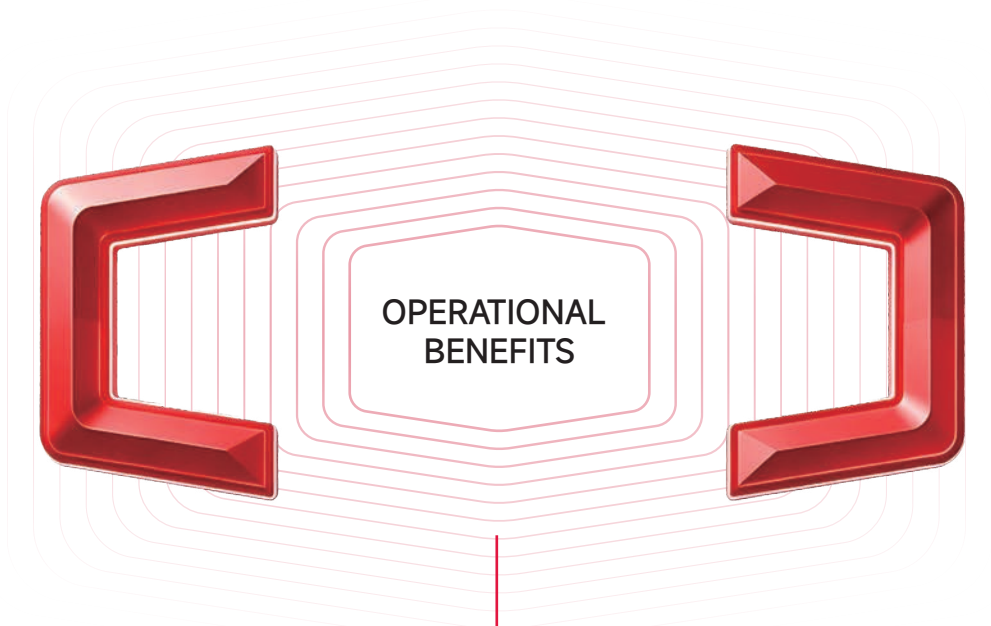
DATA SEARCH AND TRACEABILITY

- Forward and Reverse Traceability
- Data Binding



INTEGRATED PRODUCTION MANAGEMENT

- Material Loading Collection
- Station Routing and Pass-Through
- Rework Strategy Management
- BOM Management
- Document Management
- Production Scheduling
- Process Error-Proofing
- Barcode Printing
- Personnel Performance



Improve Production Efficiency

Full-Process Traceability

Safe and Stable Production

Automated Real-Time Monitoring



IMPROVE PRODUCTION EFFICIENCY

35% Changeover downtime reduced by 35%

28% Non-production time reduced by 28%

21% Product defect rate reduced by 21%



SAFE AND STABLE PRODUCTION

40% Fault rate reduced by 40%

25% Deviation value reduced by 25%

85% Production incidents reduced by 85%



FULL-PROCESS TRACEABILITY

Query efficiency is improved

100% Data accuracy reaches 100%

60% Comprehensive service level improves by 60%



AUTOMATED REAL-TIME MONITORING

25% Accurate delivery with NPL reduced by 25%

20% Product inventory reduced by 20%

Data entry and system login time reduced

DIGITAL TWIN

UPTEC has successfully delivered the “Innovative Demonstration Smart Factory — Digital Twin + Virtual Commissioning” project. Taking the flat-wire stator coating station as the pilot, the physical factory is precisely mapped to the digital world through advanced 5G communication technology and 3D reverse modeling. This solution realizes real-time monitoring, simulation optimization and intelligent decision-making across the entire production-line life cycle, providing manufacturing enterprises with comprehensive digital capabilities from design and verification to operation, and setting a benchmark for digital smart factories.

FUNCTIONAL HIGHLIGHTS

- 01

INTEGRATION OF VIRTUAL AND PHYSICAL SYSTEMS FOR MORE ACCURATE DECISION-MAKING

High-precision 3D models are seamlessly integrated with real-time data, providing clear visibility into key workstation status and enabling early warnings of abnormal conditions.
- 02

VIRTUAL COMMISSIONING FOR COST REDUCTION AND EFFICIENCY IMPROVEMENT

Process and takt-time simulations support validation, reducing on-site commissioning time by 70% and accelerating production ramp-up.
- 03

INTELLIGENT EARLY WARNING FOR SAFE PRODUCTION

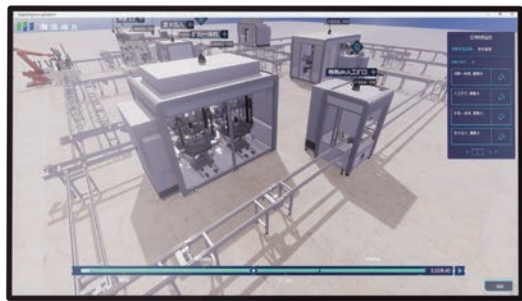
Equipment abnormalities automatically trigger real-time alerts, with data traceability for the 10 minutes preceding each alarm, significantly reducing fault-handling time.
- 04

PROCESS OPTIMIZATION FOR LEAN PRODUCTION

PLC programs are verified and optimized in a virtual environment to ensure the production line consistently achieves a takt rate of 30 JPH.
- 05

OPEN ARCHITECTURE FOR CONTINUOUS EVOLUTION

The web-based architecture supports access across multiple terminals, while the modular system architecture enables flexible expansion as business needs evolve.



TECHNICAL ADVANTAGES



TECHNICAL ARCHITECTURE
The project uses an HTML5 + Vue 3.0 frontend framework and a Three.js 3D engine, combined with microservice architecture and distributed deployment, to build a high-performance and highly reliable digital twin platform.



NETWORK PERFORMANCE
5G network supports data collection and transmission within seconds, 4K HD rendering and millisecond-level response.



BUSINESS VALUE
The digital twin solution increases average production efficiency by 25% and reduces equipment standby time by 40%.

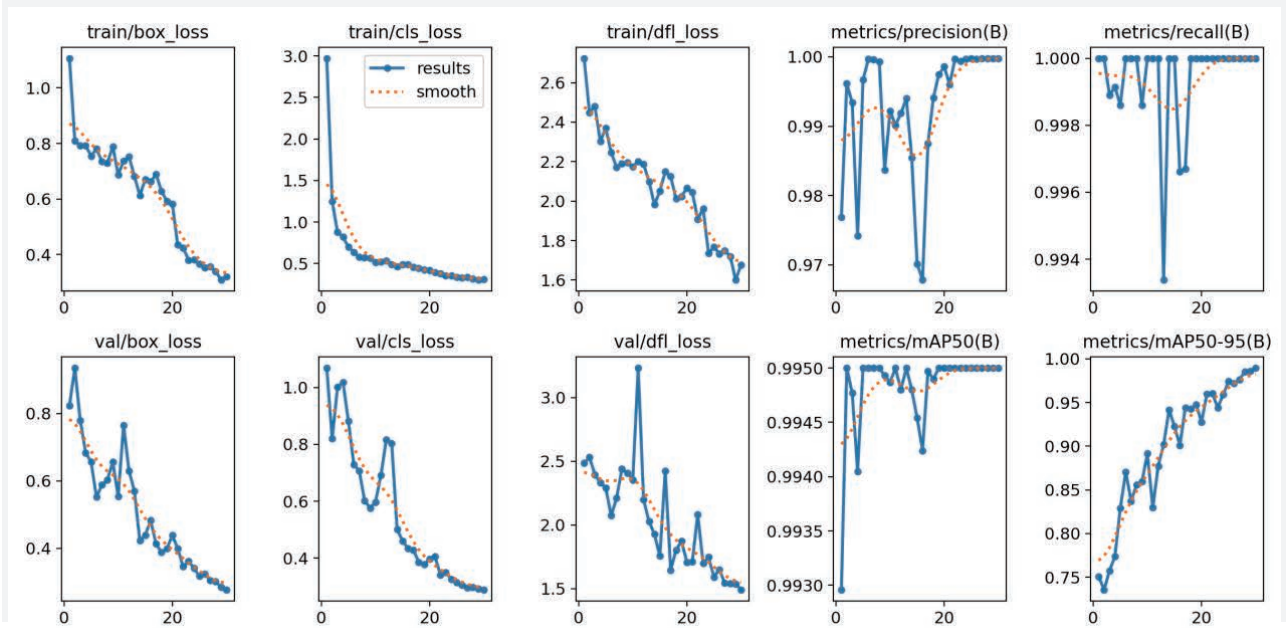
ARTIFICIAL INTELLIGENCE + MACHINE VISION

The deep integration of artificial intelligence and machine vision in industrial automation equipment is bringing revolutionary changes to modern manufacturing. Unlike traditional automation that relies on preset fixed programs and standardized actions, next-generation intelligent equipment uses AI deep learning and visual recognition to perceive autonomously, make intelligent decisions, and execute with precision. It can effectively replace manual inspection and experience-based judgment, significantly improve manufacturing precision and production efficiency, and become the core capability support of smart factories.

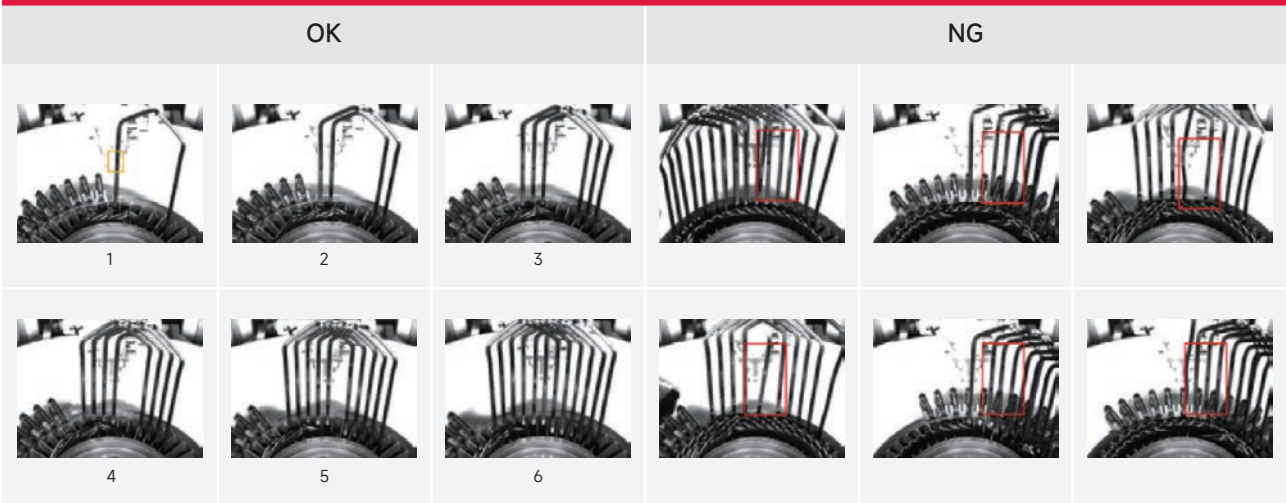
DEEP LEARNING

By combining automated manufacturing process requirements with deep-learning training methods, the system gains stronger and more robust automatic feature-extraction capabilities. This replaces traditional pre-programmed methods, improves flexibility and generalization, greatly increases development efficiency, and raises the intelligence level of production-line equipment.

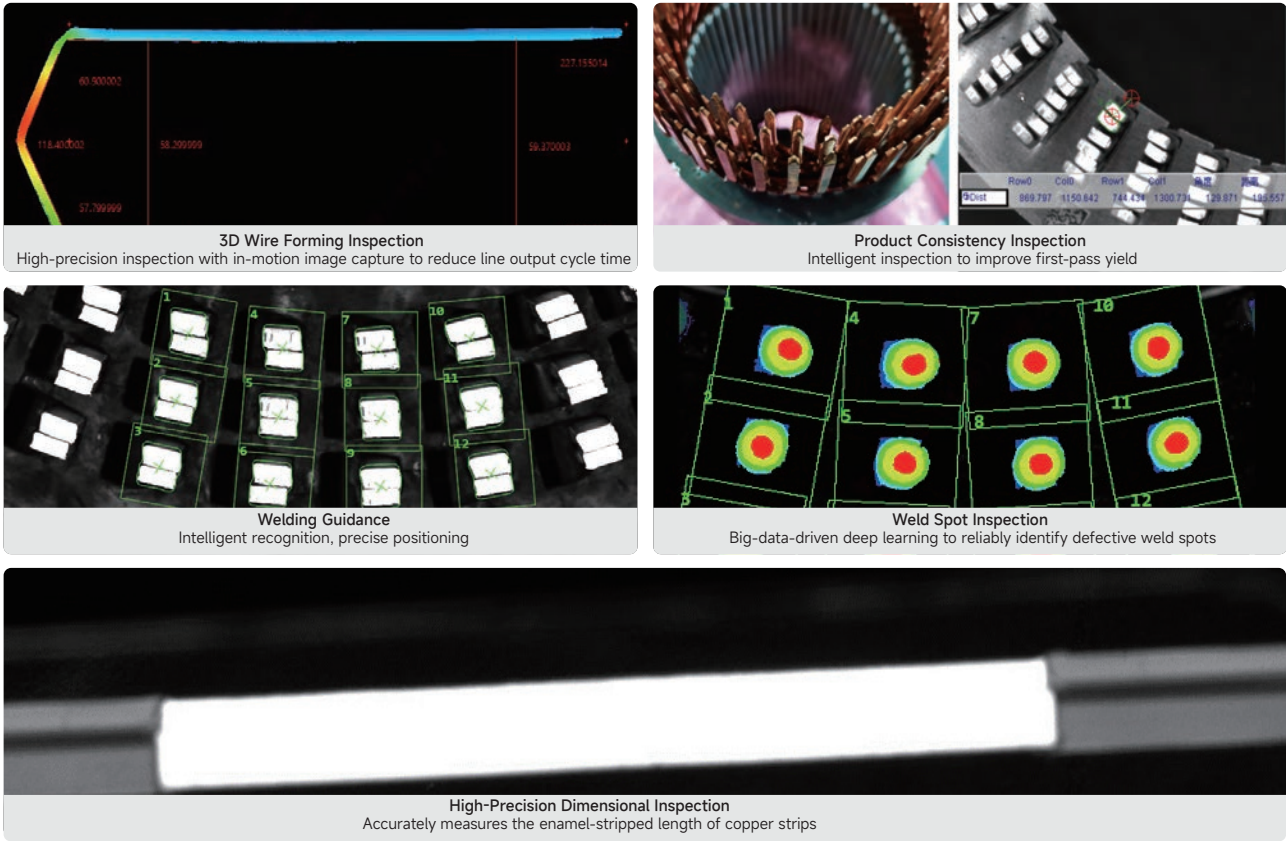
DEEP LEARNING PROCESS



CASE STUDY (STATOR FLAT-WIRE INSERTION)



FUNCTIONAL APPLICATIONS



Assembly Error-Proofing Inspection Intelligently verifies correct materials and proper placement during assembly				
Category	Sample			
482 Incorrect Orientation	 3_2024_03_02_15_26_11_67.jpg	 3_2024_03_02_15_26_23_97.jpg	 3_2024_03_02_15_26_39_08.jpg	 3_2024_10_16_01_25_45.jpg
	 3_2024_03_02_15_23_41_44.jpg	 3_2024_03_02_15_23_55_18.jpg	 3_2024_03_02_15_24_02_95.jpg	 3_2024_03_02_15_24_15_58.jpg
483	 4_2024_03_02_13_04_42_11.jpg	 4_2024_03_02_13_04_54_17.jpg	 3_2024_10_16_18_39_48_32.jpg	 3_2024_10_17_10_07_20_02.jpg
	 1_2024_03_02_13_08_02_47.jpg	 1_2024_03_02_13_08_20_00.jpg	 1_2024_03_02_13_08_32_33.jpg	 10_2024_03_03_15_14_26_45.jpg
Dynamic Balance Plate Incorrect Orientation	 1_2024_03_02_12_56_51_44.jpg	 1_2024_03_02_12_57_05_38.jpg	 1_2024_03_02_12_57_21_08.jpg	 10_2024_03_04_09_15_40_00.jpg
	 1_2024_03_02_12_56_51_44.jpg	 1_2024_03_02_12_57_05_38.jpg	 1_2024_03_02_12_57_21_08.jpg	 10_2024_03_04_09_15_40_00.jpg

FUTURE SCENARIO

FUTURE SCENARIO 1

Industrial Intelligent Platform Driven by Natural-Language Interaction

Break down data silos and enable data access with minimal technical barriers. A multimodal industrial conversational agent is built based on the integration of large language models and factory knowledge graphs. Operators can query cross-system data in real time through natural language — for example, “What were the OEE fluctuations during the past week and what material batches were involved?” The system automatically completes SQL generation, data cleaning and visual presentation, replacing the traditional manual screen-click workflow and enabling a shift from humans adapting to machines to machines understanding humans.



VISION



LANGUAGE

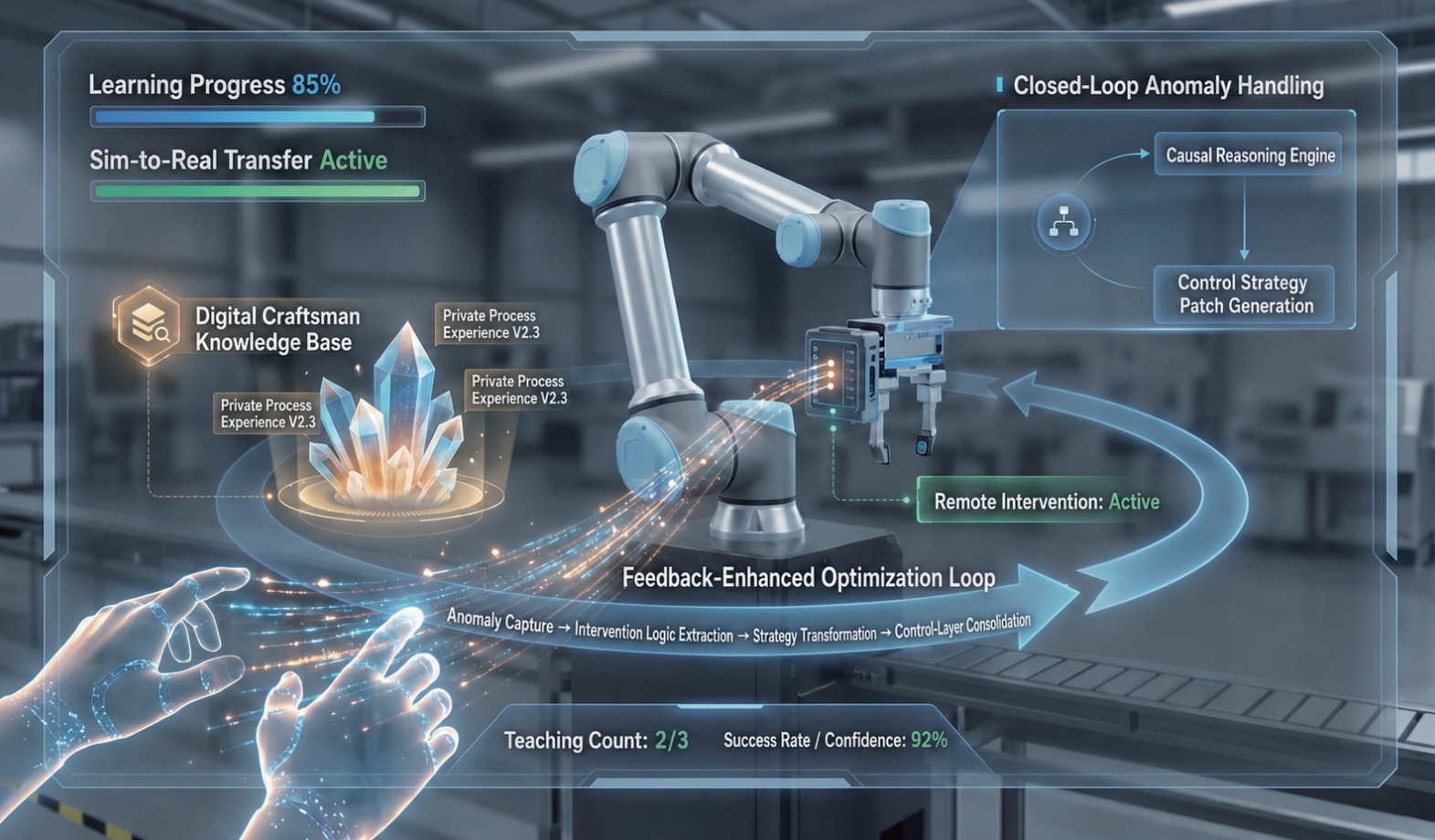


ACTION

FUTURE SCENARIO 2

Flexible Embodied Intelligent Execution System

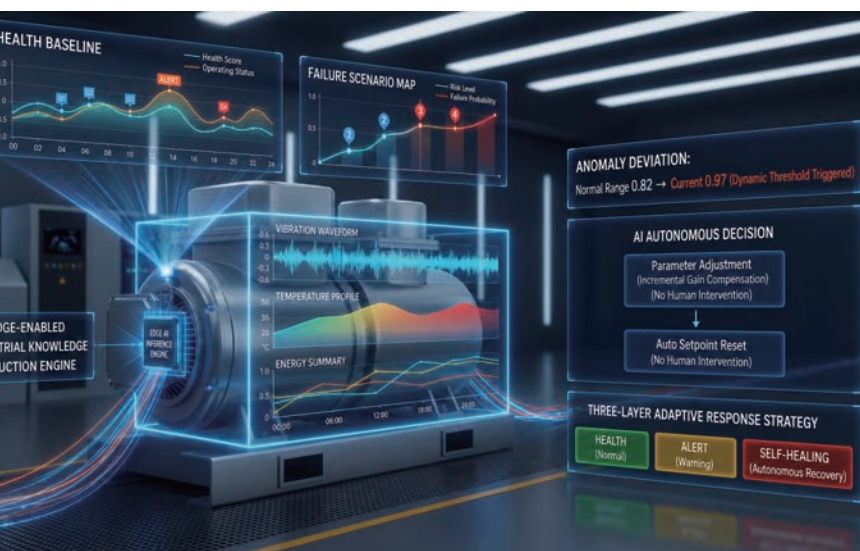
Enable cost-effective high-mix, low-volume production. Instead of relying on deterministic, hard-coded robot paths, the system deploys embodied AI agents based on multimodal vision-language-action models. Through a small number of demonstrations or simulation-to-real transfer, the system can acquire assembly skills for new products, and combines force control, visual tracking and tactile feedback to realize human-like environmental adaptability and fault tolerance in flexible production.



FUTURE SCENARIO 3

Continuous Self-Learning Optimization and Knowledge Accumulation Mechanism

Build manufacturing assets that become smarter with use, establish a feedback-enhanced optimization loop. After handling each abnormal incident, the system automatically captures engineers' intervention logic and troubleshooting strategies. It converts such data into executable control-policy patches via causal-inference algorithms. The accumulated experience is deposited into the equipment control layer in the form of digital craftsman knowledge, enabling autonomous evolution of control logic and building a proprietary process knowledge base exclusive to the enterprise.



FUTURE SCENARIO 4

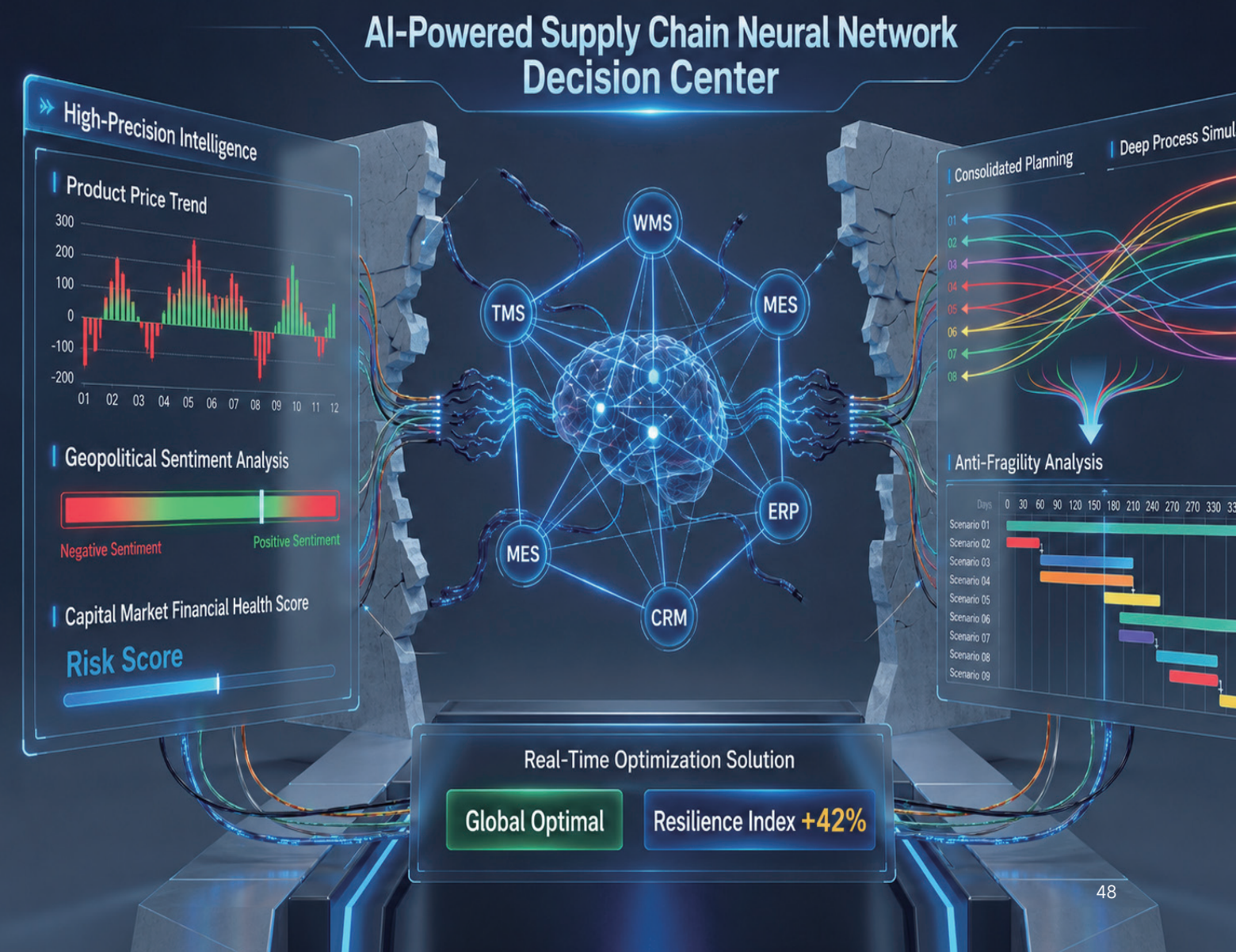
Cognitive Predictive Maintenance and Autonomous Decision-Making System

Transform from reactive maintenance to zero-downtime operation. Deploy an industrial cognitive engine at edge nodes to construct dynamic digital twins. Leverage time-series deep-learning models to analyze vibration, temperature, power-use data in real-time and build health baselines and fault-evolution diagrams. Once anomaly deviation surpasses dynamic thresholds, AI agents evaluate impact severity and launch tier-based responses such as parameter auto-tuning and self-restart with no manual involvement.

FUTURE SCENARIO 5

Full-chain intelligent operation decision-making and dynamic scheduling optimization

Transition from local optimality to global-level supply-chain resilience. Construct a supply-chain neural network to eliminate silos across WMS, TMS, MES, ERP and CRM. The AI engine integrates internal operational data and external insights such as commodity indexes, geopolitical news sentiment and supplier financial status. Powered by mixed-integer programming and deep reinforcement learning, it delivers anti-fragile dynamic schedules.



INNOVATION AND R&D



INNOVATION

+



STANDARD

+



SPEED



PRODUCT

+



PROCESS

+

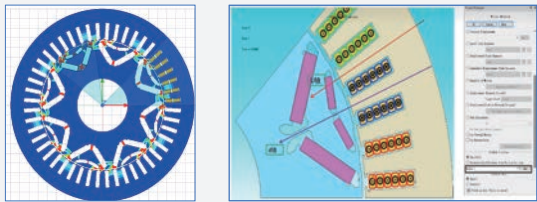


EQUIPMENT

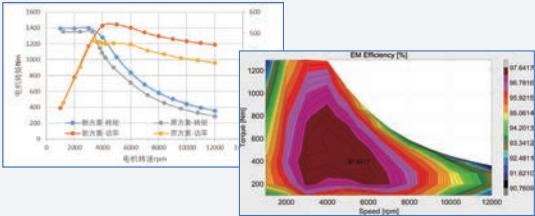
Since its founding, UPTEC has remained committed to continuous innovation. We have opened up new opportunities in flat-wire motor equipment, established multiple process standards for the industry, set global industry speed records, demonstrating the strength of China's intelligent manufacturing.

UPTEC has one-stop solution capabilities across "product + process + equipment," achieving a closed-loop innovation model of product-structure optimization, process upgrades, and synchronized equipment development.

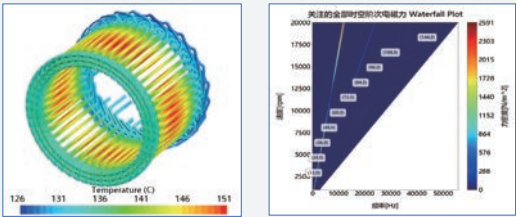
MOTOR R&D



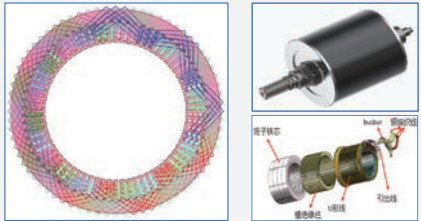
Electromagnetic Schemes and Multi-Objective Simulation Optimization



Performance Characteristics and Efficiency Map Analysis



Thermal Field and NVH Analysis



Winding and Structural Design

PROCESS R&D

FULL-PROCESS PROCESS DEVELOPMENT AND MANUFACTURING CAPABILITY FOR DIFFERENT STATOR TYPES

HAIR-PIN



FORMING



INSERTION



TWISTING



CUTTING

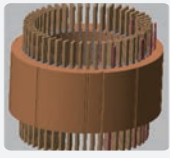


WELDING

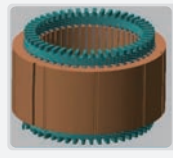
I-PIN



FORMING



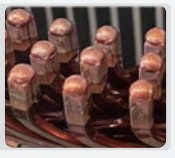
INSERTION



TWISTING



CUTTING

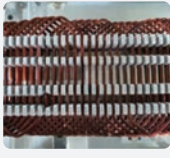


WELDING

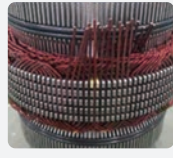
WAVE-PIN



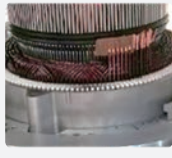
FORMING



WIRE WEAVING



WINDING



EMBEDDING



SLOT INSERTION TOOLING

X-PIN



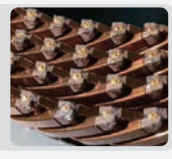
FORMING



INSERTION



TWISTING



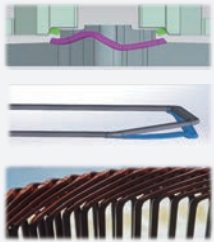
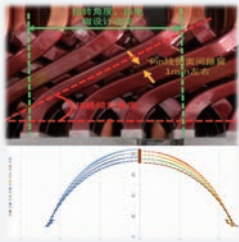
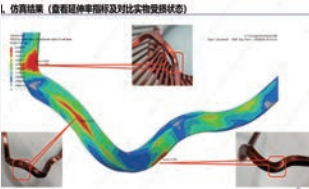
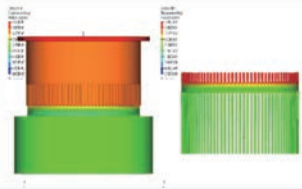
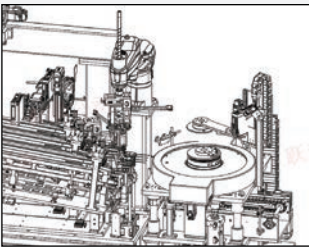
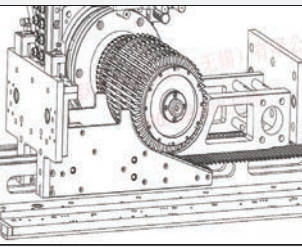
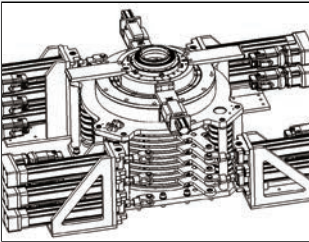
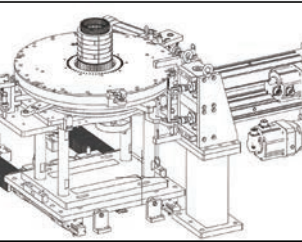
WELDING

SPECIAL TWISTING AND WELDING PROCESSES



EQUIPMENT R&D

CONTINUOUS PROCESS OPTIMIZATION DRIVES EQUIPMENT ITERATION AND UPGRADES

WIRE-FORMING PROCESS 	TWISTING PROCESS 
WIRE-FORMING SIMULATION 	TWISTING SIMULATION 
FIRST-GENERATION INSERTION TECHNOLOGIES 	SECOND-GENERATION INSERTION TECHNOLOGIES 
FIRST-GENERATION TWISTING TECHNOLOGIES 	SECOND-GENERATION TWISTING TECHNOLOGIES 



PROCESS INPUT



PROTOTYPE EQUIPMENT AND TOOLING



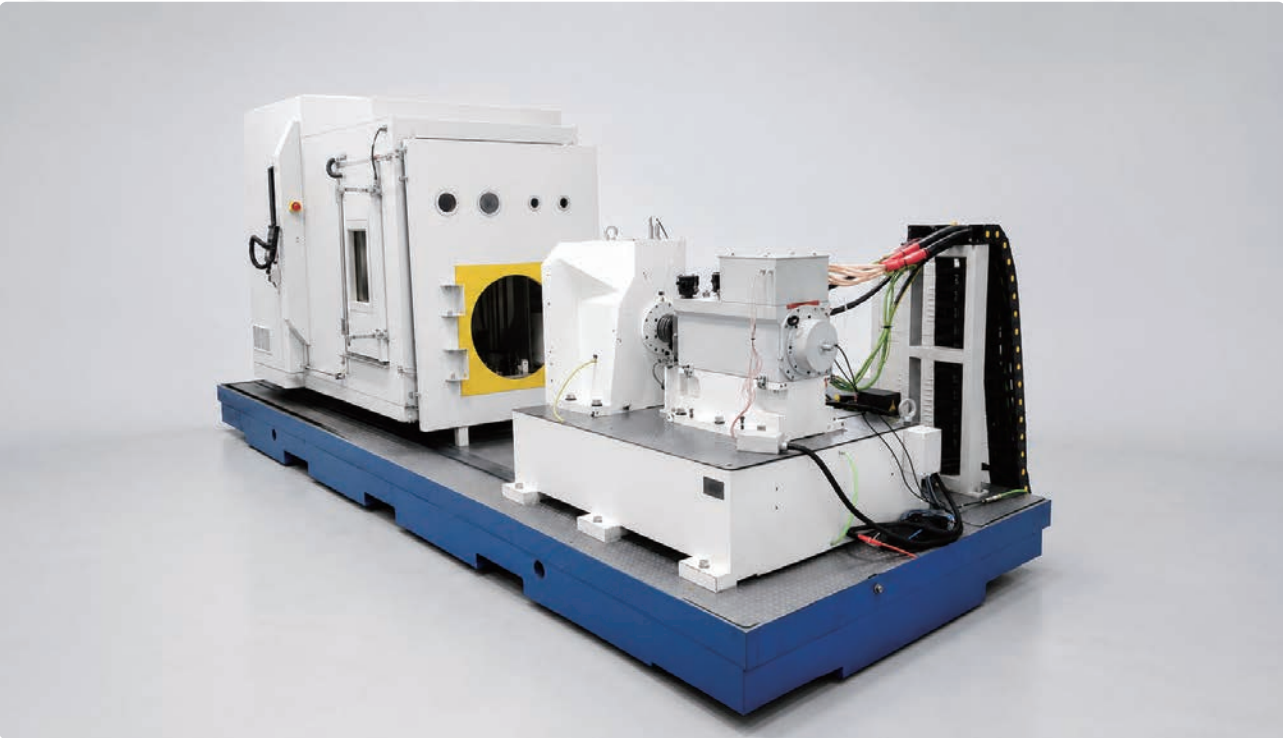
MASS-PRODUCTION EQUIPMENT



ITERATION AND UPGRADE



MOTOR TESTING



COMPREHENSIVE TESTING AND VALIDATION CAPABILITIES

01 No-load characteristic test	02 External characteristic test
03 Efficiency-map test	04 Temperature-rise test under operating conditions
05 NVH test	06 Overspeed test
07 Vibration and shock test	08 Cyclic durability test

CORE COMPETITIVENESS



CROSS-DOMAIN INNOVATION

UPTEC has a team of more than 200 experts in automotive powertrains, drive-motor development and intelligent manufacturing equipment, with one of the largest teams of its kind in China.



FORWARD-LOOKING EXPERTISE

UPTEC has accumulated extensive experience in flat-wire motor product development, design and batch manufacturing as well as production-process data, helping customers avoid risks at the early R&D stage.



HIGH-EFFICIENCY DELIVERY

UPTEC has one-stop solution capabilities across “product + process + equipment,” with full-process flat-wire motor process R&D capability, helping customers select the most suitable process route and rapidly implement customized production lines.



RELIABILITY AND EXCELLENCE

Through extensive production-line equipment development practice, UPTEC continuously meets customers’ core requirements in high precision, stability, production efficiency, yield, consistency and automation.



COMPLETE-LINE SOLUTIONS

UPTEC has global innovation capabilities and local manufacturing capabilities. With scenario-based, intelligent, flexible and standardized solutions, UPTEC provides more cost-effective turnkey e-drive production-line equipment.



LONG-TERM COMMITMENT

UPTEC adheres to long-term technological value, continuously optimizing details and pursuing excellence, building competitive barriers through technology and earning customer trust through value.

FUTURE DEVELOPMENT



MANUFACTURING CENTER | A SOLID DELIVERY FOUNDATION



R&D CENTER | BREAKING THROUGH TECHNOLOGICAL BOTTLENECKS



STRATEGY CENTER | EXPANDING INTO EMERGING MARKETS

To Be a World-Class Leader in E-Drive Technology and Equipment

Seizing the historic opportunities created by the global new-energy vehicle revolution and the reshaping of the industrial landscape, UPTEC has formulated its second five-year development plan. It has established three organizational centers, using manufacturing enablement, technological innovation and scenario expansion as foundations to grow into a world-class leader in e-drive technology and equipment.

WORLD-CLASS QUALITY

UPTEC's quality commitment is built on performance and focused on customer value. Working with top global industrial component suppliers, UPTEC is committed to providing world-class intelligent manufacturing complete-line equipment to customers worldwide.

FANUC	SICK	MIYACHI	KUKA	Lenze	THK	Weidmüller	ifm
SEW EURODRIVE	BANNER	SIEMENS			KEYENCE	CAPTRON	WAGO
Schneider Electric	Eaton				PHILIPS	Rockwell Automation	RITTAL
TRUMPF	OMRON	TURCK			PHOENIX CONTACT	IPG PHOTONICS	EUCHNER
PILZ	Honeywell	ZEBRA			STÄUBLI	BALLUFF	SKF
MURR ELEKTRONIK	ZIMMER group	FESTO	EMERSON	YAMAHA	KISTLER	Panasonic	Rexroth
ABB	Orientalmotor	MISUMI	SCHUNK	SMC	COHERENT	Ceia	COGNEX

EXCEPTIONAL CUSTOMER EXPERIENCE

UPTEC always works from the customer’s perspective, delivering an efficient end-to-end service experience from requirements analysis and solution delivery to production-line implementation, commissioning, ramp-up and handover.

FAST DELIVERY

UPTEC has standardized production-line equipment designs that have been validated through mass production. Based on each customer’s product specifications and requirements, UPTEC analyzes production processes and selects standard modules from process and equipment module libraries to achieve flexible configuration and rapid design.

STANDARDIZED DESIGN

UPTEC’s self-developed PPDS software system effectively solves these problems. After relevant product information is entered, the system quickly outputs theoretically optimal parameters for each process; engineers then fine-tune on that basis, greatly improving commissioning efficiency.

EFFICIENT COMMISSIONING

Flat-wire stator manufacturing processes are highly interconnected; a change in one process can affect the entire line. Commissioning is difficult and time-consuming, and the production line must be compatible with different product models. New-product launches require a large number of parameters to be commissioned, which can reduce commissioning efficiency.

MODULAR DEVELOPMENT

Approximately 80% of the equipment structures in UPTEC production lines are selected from standard libraries, while about 20% of the mechanical structure is redesigned according to customer needs, significantly shortening the design cycle.



AFTER-SALES SERVICE

